

CLAIMS

1. A backside protective sheet for a solar battery module, comprising: a deposited assembly comprising a vapor-deposited film of an inorganic oxide provided on at least one side of a substrate; and a transparent or translucent heat-resistant polyolefin resin layer provided on both sides of said deposited assembly.

2. A backside protective sheet for a solar battery module, comprising: a superimposed laminate comprising a plurality of deposited assemblies superimposed on top of each other, said plurality of deposited assemblies each comprising a vapor-deposited film of an inorganic oxide provided on at least one side of a substrate; and a transparent or translucent heat-resistant polyolefin resin layer provided on both sides of said superimposed laminate.

3. The backside protective sheet for a solar battery module according to claim 2, wherein said superimposed laminate comprises said deposited assemblies superimposed on top of each other through a tough resin layer.

4. The backside protective sheet for a solar battery module according to any one of claims 1 to 3, wherein at least one of the polyolefin resin layers provided respectively on said both sides comprises a coloring additive.

5. The backside protective sheet for a solar battery module according to claim 4, wherein said coloring additive contained in one of the polyolefin resin layer is different from said coloring additive contained in the other polyolefin resin layer in color.

6. A backside protective sheet for a solar battery module,

comprising: a deposited assembly comprising a vapor-deposited film of an inorganic oxide provided on at least one side of a substrate; a heat-resistant polyolefin resin layer comprising a coloring additive and provided on one side of said deposited assembly; and a heat sealing resin layer provided on the other side of said deposited assembly.

7. A backside protective sheet for a solar battery module, comprising: a superimposed laminate comprising a plurality of deposited assemblies superimposed on top of each other, said plurality of deposited assemblies each comprising a vapor-deposited film of an inorganic oxide provided on at least one side of a substrate; a heat-resistant polyolefin resin layer comprising a coloring additive and provided on one side of said superimposed laminate; and a heat sealing resin layer provided on the other side of said superimposed laminate.

8. The backside protective sheet for a solar battery module according to claim 7, wherein said superimposed laminate comprises said deposited assemblies superimposed on top of each other through a tough resin layer.

9. The backside protective sheet for a solar battery module according to any one of claims 1 to 8, wherein said heat-resistant polyolefin resin layer comprises an ultraviolet absorber and a photostabilizer.

10. The backside protective sheet for a solar battery module according to any one of claims 1 to 9, wherein a surface-treated layer is provided between said layers.

11. The backside protective sheet for a solar battery module according to claim 10, wherein said surface-treated layer has been formed by pretreatment selected from the group consisting of corona discharge treatment, ozone treatment, plasma treatment, glow discharge treatment, and oxidation

treatment using a chemical agent.

12. The backside protective sheet for a solar battery module according to claim 10, wherein said surface-treated layer has been formed using a treatment selected from the group consisting of primer coating agents, undercoating agents, anchor coating agents, adhesives, and vapor deposition anchor coating agents.

13. The backside protective sheet for a solar battery module according to any one of claims 1 to 12, wherein said heat-resistant polyolefin resin layer further comprises an antioxidant.

14. The backside protective sheet for a solar battery module according to claim 13, wherein said antioxidant is selected from the group consisting of phenol, amine, sulfur, and phosphoric acid antioxidants.

15. The backside protective sheet for a solar battery module according to any one of claims 1 to 14, wherein said polyolefin resin layer is provided through an adhesive layer for lamination.

16. The backside protective sheet for a solar battery module according to any one of claims 1 to 14, wherein said polyolefin resin layer is provided through a melt extruded resin layer.

17. The backside protective sheet for a solar battery module according to any one of claims 1 to 16, wherein said substrate is formed of a resin selected from the group consisting of cyclic polyolefin resins, polycarbonate resins, poly(meth)acrylic resins, polystyrene resins, polyamide resins, and polyester resins.

18. The backside protective sheet for a solar battery module according to any one of claims 1 to 17, wherein said vapor-deposited film is a single layer film or multilayer film of two or more layers formed of the same kind of inorganic oxide, or a composite film of two or more layers formed of dissimilar inorganic oxides.

19. The backside protective sheet for a solar battery module according to any one of claims 1 to 18, wherein said vapor-deposited film has a thickness of 50 to 4000 angstroms.

20. The backside protective sheet for a solar battery module according to any one of claims 1 to 19, wherein said vapor-deposited film has been formed by chemical vapor deposition or physical vapor growth.

21. The backside protective sheet for a solar battery module according to any one of claims 1 to 20, wherein said polyolefin resin layer is formed of a polypropylene resin containing a coloring additive, an ultraviolet absorber, and a photostabilizer incorporated by milling.

22. The backside protective sheet for a solar battery module according to any one of claims 1 to 21, wherein said polyolefin resin layer further comprises a flame retardant.

23. The backside protective sheet for a solar battery module according to claim 22, wherein said flame retardant comprises one or at least two compounds selected from the group consisting of phosphorus, phosphorus and halogen, chlorine, bromine, aluminum hydroxide, antimony, magnesium hydroxide, guanidine, zirconium, and zinc borate flame retardants.

24. The backside protective sheet for a solar battery module according to any one of claims 4 to 23, wherein said

coloring additive is selected from the group consisting of blackening agents, whitening agents, and bluing agents.

25. The backside protective sheet for a solar battery module according to claim 24, wherein said blackening agent comprises a black pigment.

26. The backside protective sheet for a solar battery module according to claim 24, wherein said whitening agent comprises a white pigment.

27. The backside protective sheet for a solar battery module according to claim 26, wherein said white pigment comprises one or at least two compounds selected from the group consisting of basic lead carbonate, basic lead sulfate, basic lead silicate, zinc flower, zinc sulfide, lithopone, antimony trioxide, anatase form of titanium oxide, and rutile form of titanium oxide.

28. The backside protective sheet for a solar battery module according to claim 24, wherein said bluing agent comprises a blue pigment.

29. The backside protective sheet for a solar battery module according to any one of claims 9 to 28, wherein said ultraviolet absorber comprises at least one inorganic compound selected from the group consisting of benzophenone, benzotriazole, salicylate, acrylonitrile, and metallic complex salt ultraviolet absorbers, ultrafine particle titanium oxide having a particle diameter of 0.01 to 0.06 μm , and ultrafine particle zinc oxide having a particle diameter of 0.01 to 0.04 μm .

30. The backside protective sheet for a solar battery module according to any one of claims 9 to 29, wherein said photostabilizer comprises at least one compound selected from hindered amine compounds.

31. The backside protective sheet for a solar battery module according to any one of claims 21 to 30, wherein said polypropylene resin comprises a resin of a homopolymer of propylene or a copolymer of propylene with other monomer.

32. The backside protective sheet for a solar battery module according to any one of claims 6 to 31, wherein said heat sealing resin layer is formed of a polyolefin resin or an ethylene-vinyl acetate copolymer resin.

33. The backside protective sheet for a solar battery module according to any one of claims 3 to 32, wherein said tough resin layer is formed of a biaxially stretched polyethylene terephthalate film or polypropylene resin film.

34. The backside protective sheet for a solar battery module according to any one of claims 15 and 17 to 33, wherein said adhesive layer for lamination is formed of an adhesive selected from the group consisting of polyvinyl acetate adhesives, polyacrylate adhesives including homopolymers of ethyl acrylate, butyl acrylate or 2-ethylhexylester acrylate, and copolymers of those homopolymers and methyl methacrylate, acrylonitrile or styrene, cyanoacrylate adhesives, ethylene copolymer adhesives including copolymers of ethylene with monomers including vinyl acetate, ethyl acrylate, acrylic acid, methacrylic acid and the like, polyolefin adhesives including polyethylene resins or polypropylene resins, cellulose adhesives, polyester adhesives, polyamide adhesives, polyimide adhesives, amino resin adhesives including urea resins and melamine resins, phenolic resin adhesives, epoxy adhesives, polyurethane adhesives, reactive (meth)acrylic adhesives, rubber adhesives including chloroprene rubbers, nitrile rubbers, styrene-butadiene rubbers, or styrene-isoprene rubbers, silicone adhesives, and inorganic adhesives including alkaline metal silicates or low-melting glass.

35. The backside protective sheet for a solar battery module according to claim 34, wherein said adhesive for lamination causes a heat- or photoenergy-induced reaction in the presence of a curing agent or a crosslinking agent to form a crosslinked structure.

36. The backside protective sheet for a solar battery module according to claim 35, wherein said curing agent or said crosslinking agent comprises an isocyanate compound.

37. The backside protective sheet for a solar battery module according to any one of claims 16 to 33, wherein said melt extruded resin layer is formed of a resin selected from the group consisting of low-density polyethylenes, medium-density polyethylenes, high-density polyethylenes, straight-chain (linear) low-density polyethylenes, polypropylenes, ethylene-vinyl acetate copolymers, ionomer resins, ethylene-ethyl acrylate copolymers, ethylene-acrylic acid copolymers, ethylene-methacrylic acid copolymers, ethylene-propylene copolymers, and methyl pentene polymers, and acid-modified polyolefin resins produced by modifying polyolefin resins, such as polyethylene resins or polypropylene resins, by an unsaturated carboxylic acid, such as acrylic acid, methacrylic acid, maleic anhydride, fumaric acid, or itaconic acid.

38. A module for a solar battery, comprising the backside protective sheet for a solar battery module according to any one of claims 1 to 37, said module having been produced through integral molding by a pressure contact bonding lamination process comprising stacking said protective sheet, a filler layer, a solar battery element, a filler layer, and said protective sheet on top of one another in that order so that said polyolefin resin layer or said heat sealing resin layer provided on one side of said protective sheet faces said filler layer, and subjecting the

resultant laminate to vacuum suction.